Telescience Resource Kit (TReK)

Operational Readiness Review

TReK Release 2

September 27, 2002

NASA/Michelle Schneider

NASA/Chris Sims

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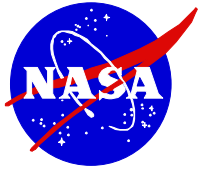
NASA/Jimmy Whitaker

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Agenda

- ## Release 2 Capabilities

- ## Issues, Notes, and Helpful Hints

- ## Release 2 Validation Testing Results

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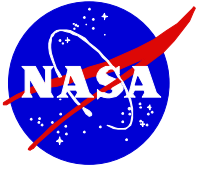**George C. Marshall Space Flight Center**

Release 2 Capabilities

- Includes all Release 1 Capabilities

- Command Capabilities

  - Command Processing Application

  - Command Trainer Application

  - Command Database Application

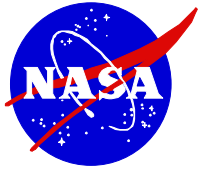 - Command User API Library

- Telemetry Enhancements

Note: For a detailed list of capabilities, please visit the TReK Web Site Release 2 Page.

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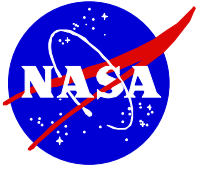**George C. Marshall Space Flight Center**

Database

- Database Forms
  - If a ' (single quote) character is used in a database query this can generate an error.
  - A query using the string `my'cal` would generate an error.
  - This error can be avoided by using the string `my*` for the query.
  - Also, entering a ' (single quote) when inserting data into a primary key field will generate an error when you try to save the record.

- Extra quotes in a field of a record in the EHS database text files will cause the Convert processes to fail.

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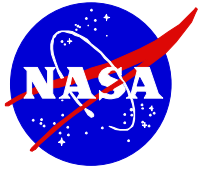**George C. Marshall Space Flight Center**

VPN Client

- The CheckPoint SecuRemote VPN client used by TReK must be configured to send "keep alive" packets to support long duration command and CDP connections with the POIC.

- Step by step instructions can be found on the POIC website under the heading POIC VPN Client Interface Procedures.

TCP Connections

- Unlike UDP, TCP must wait an elapsed amount of time prior to releasing a closed connection and reusing its resources (i.e., the port is available for a new TCP connection).

- The default setting for the timed wait delay in Windows 2000 is four minutes which may cause TReK to fail its packet or command destination activation sequence when attempting to immediately re-establish a dropped connection on the same port.

- To modify the default 4 minute delay you can add the TcpTimedWaitDelay key to the registry using regedit.

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TCP Connections Continued

- The TcpTimedWaitDelay registry key should be added as follows:
  - Location: HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\Tcpip\Parameters
  - Data Type: REG_DWORD
  - Range: 0x1E – 0x12c (30 – 300 seconds)
  - Default Value: 0xF0 (240 seconds = 4 minutes)

- To use 30 seconds, enter 1e in Hex or 30 in Decimal.

Note: Search for TcpTimedWaitDelay in Microsoft On-Line Help for more information.

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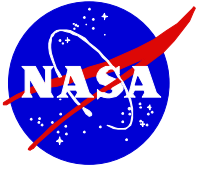**George C. Marshall Space Flight Center**

Forwarding GSE Packets Via TCP

- There is a known problem with the packet length in GSE packets sent from the POIC (HPR #D9112).

- This problem prevents TReK from receiving the data via TCP forwarding from another TReK system.

- If you are forwarding GSE packets, you should not use TCP. You should continue to use UDP.

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Custom Data Packets

- The CDP capability in the Telemetry Processing application does not allow a user to request the unprocessed, converted, and calibrated value for a single parameter in the same CDP request. (Note: You can work around this by making multiple requests to get the data unprocessed, converted, and calibrated if necessary.)

- The Start CDP Transmission request should be sent within 1 minute after the CDP packet activates.
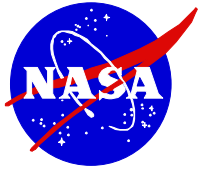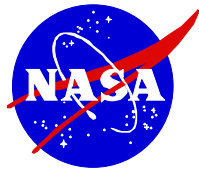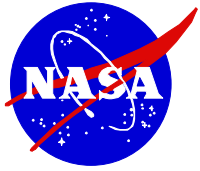
Incorrect SCT for Record Files

- All previous versions of TReK software incorrectly named the SCT version of a record file.
  - The spacecraft start and stop times in the SCT filename incorrectly added the user's time zone offset to the SCT time. For example, an SCT time of 01:00:00 in the Central time zone became 07:00:00 in the SCT record file name.

- TReK Release 2 corrects this problem but prevents users from requesting spacecraft time playbacks which includes files recorded using TReK Release 2 and a previous version of TReK software.
  - Users may still request spacecraft time playbacks from files recorded with a previous version of TReK; however, the playbacks should be requested using the files' incorrect spacecraft time.

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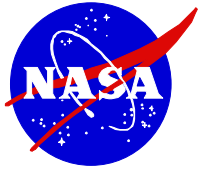
Parameter Recording/Extraction

- Using a delimiter character for Parameter Recording or Extraction files that matches a possible character in the output may render the file useless.

- Example 1, using a colon as the delimiter will cause problems when using a time in a file since TReK prints the time like this, hh:mm:ss.

- Example 2, using a comma as the delimiter and having the string "hello, world" in the downlink will cause problems.

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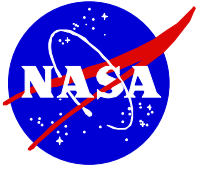
TReK/SCS Commanding

- There is a known problem with the Suitcase Simulator's calculation of the checksum for commanding. When this problem was discovered, a work-around was released through the TReK web site.

- The current schedule for the Suitcase Simulator fix is after the TReK Release 2 operational date. TReK Release 2 contains the quick fix discussed above.

- When the Suitcase Simulator fix is released, a TReK service pack will be released to "unfix" the fix so TReK can correctly calculate the checksum once again.

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Non-Blocking Destinations

- TReK can perform checks prior to sending uplink requests to the POIC. If the check for Valid Mnemonic is performed on a Non-Blocking Destination and the mnemonic provided by the user is invalid, the destination will hang (i.e., it keeps checking to see if the mnemonic is valid).

- It is suggested that you do not use the Valid Mnemonic check for Non-Blocking destinations.

- If this occurs operationally, just change the destination's properties to not check for invalid mnemonics.
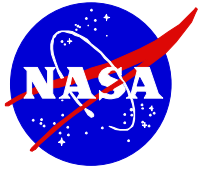
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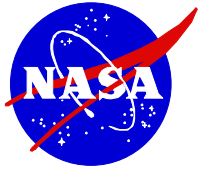**George C. Marshall Space Flight Center**

Commands List

- An intermittent problem occurs when activating destinations in the Command Processing application. Sometimes the commands will appear twice for the destination in the Commands dialog. All commands in the list may still be selected and used for updates and uplinks.

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Floating-Point Numbers

- All floating point numbers cannot be represented in the IEEE floating point format which is used to store floating-point numbers locally. This is not considered a problem.

- For example, if you enter .3 for a 32 bit IEEE floating-point command field the actual bit pattern stored for the number is 3e99999a. This hex pattern is equivalent to 0.299999999999999999.

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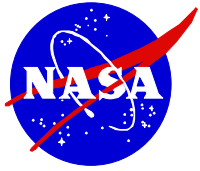**George C. Marshall Space Flight Center**

Floating-Point Numbers

- If you enter 3.5453356601345771e-40 for a command field and update the POIC database, the number 3.5453356601345771e-040 will be sent (note the extra zero after the minus sign). The POIC has a 22 character limit for the database field and the number will be rejected.

- This will only be an issue if you must update the POIC database with floating-point numbers that have this level of precision.

- If you use TReK to build the uplink pattern (BuildAndUplinkCommand), this issue will not be a problem.

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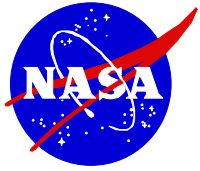**George C. Marshall Space Flight Center**

Helpful Hints

- If VPN isn't running, Command destination or CDP packet activation will fail when attempting to log into ERIS in the POIC. It may not be clear that the failure is occurring because VPN is not running.

- When using the EHS DSM capability, it's a good idea to name the data file and the RPSM file with the same base filename. Example apid700 and apid700.rpsm. On the TReK side these files should be placed in the same directory. If the .RPSM file is not available or properly named, TReK will still attempt to convert the data file.

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Validation Testing Results

- TReK validation tests were derived from the TReK Release 2 Validation Test Plan (TReK-074).

- TReK testing started May 2002 with Beta Release E and continued through Release 2.

- New capabilities were the main focus of Release 2 testing with minimum regression testing of previously delivered capabilities.

- 210 TReK Problem Reports (TPRs) generated.
  - Withdrawn (9)
  - Testing Closed (193)
  - Open (7)
  - On Hold (1)

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Validation Testing Results

- Further Release 2 validation testing will be performed in the following areas:

  – Compatibility testing of commanding and telemetry applications.

  – Custom Data Packets (CDP)

  – Database Applications (Convert EHS Database Files & Add A Packet capabilities)

  – Telemetry Data Playbacks With Old And New Formats

  – Endurance Testing

  – Documentation & Online Help

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